

$$\bullet (a \pm b)^2 = a^2 \pm 2ab + b^2$$

$$\bullet a^2 - b^2 = (a+b)(a-b)$$

$$\bullet x^{-m} = \frac{1}{x^m}$$

$$\bullet \sqrt[q]{x^p} = x^{p/q}$$

Trick to multiply terms

$$h(x) = (2x+1)(3x^2+2x+1) = 6x^3 + 7x^2 + 4x + 1$$

	$3x^2$	$2x$	1
$2x$	$6x^3$	$4x^2$	$2x$
1	$3x^2$	$2x$	1

$$\tan x = \frac{\sin x}{\cos x}$$

$$\csc x = \frac{1}{\sin x}$$

$$\cot x = \frac{\cos x}{\sin x}$$

$$\sec x = \frac{1}{\cos x}$$

	0	$\pi/6$	$\pi/4$	$\pi/3$	$\pi/2$
\sin	$0/2$	$1/2$	$\sqrt{2}/2$	$\sqrt{3}/2$	$\sqrt{4}/2 = 1$
\cos	$\sqrt{4}/2$	$\sqrt{3}/2$	$\sqrt{2}/2$	$1/2$	$0/2 = 0$

$$e^{\ln x} = \exp[\ln x] = x$$

$$\ln[e^x] = x$$

Remember $\sin^2 x = [\sin x]^2 \neq \sin(x^2)$

Logarithmic Properties

(a) $\ln e^x = x$

(b) $\ln(ab) = \ln(a) + \ln(b)$

(c) $\ln\left(\frac{a}{b}\right) = \ln(a) - \ln(b)$

(d) $\ln(a^x) = x \ln(a)$

a-c method for factoring

ex. $4x^2 - 4x - 3$

 a b c

First find $ac = 4 \cdot (-3) = -12$

Next list all factors of $ac = -12$

	1	12
	2	6
	3	4

The idea is to add the factors to yield $b = -4$
Note since $ac = -12$ and $b = -4$ the largest factor gets a negative. So

$ac = -12$

	1	-12	= -11
	2	-6	= -4 = b
	3	-4	= -1

Rewrite the middle term with the numbers in the pink box.

$$4x^2 - 4x - 3 = 4x^2 + 2x - 6x - 3$$

Now factor by grouping.

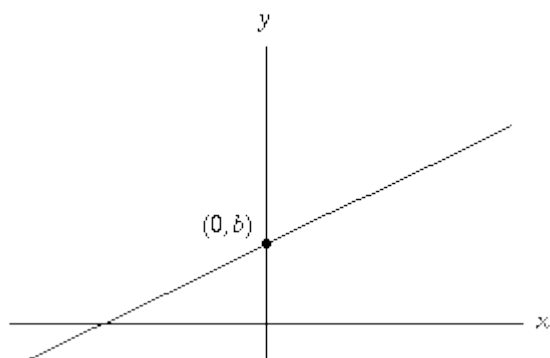
$$= 2x(2x+1) - 3(2x+1)$$

Check that the parenthesis match.

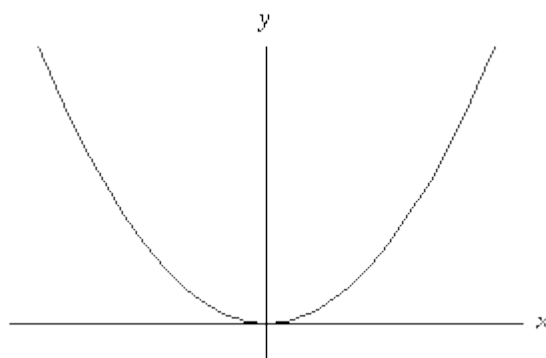
$$= (2x-3)(2x+1)$$

MA 16020 LESSON 12: AREA BETWEEN TWO CURVES (ALGEBRA REVIEW)

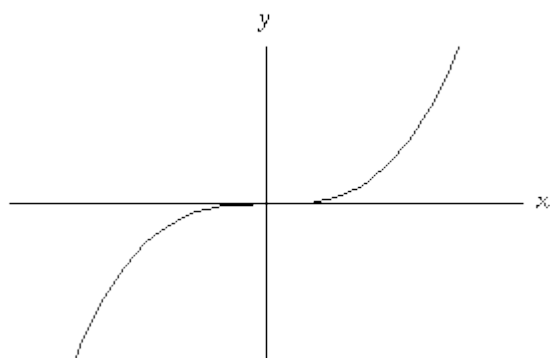
Common Graphs:



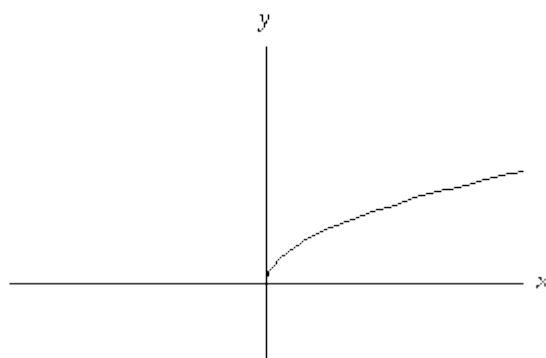
$$y = mx + b$$



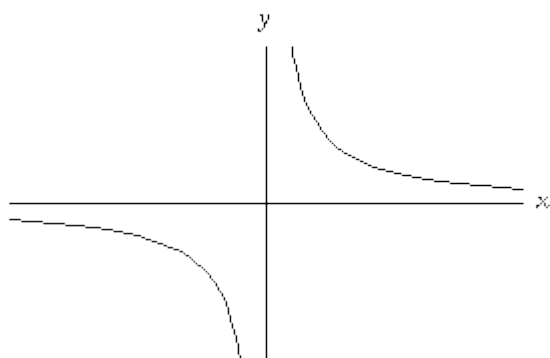
$$y = x^2$$



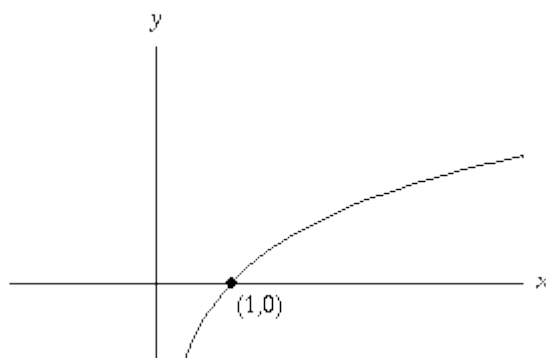
$$y = x^3$$



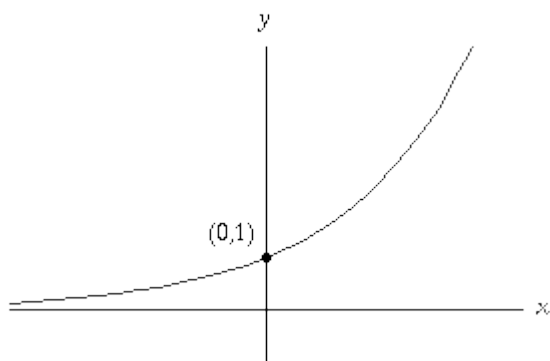
$$y = \sqrt{x}$$



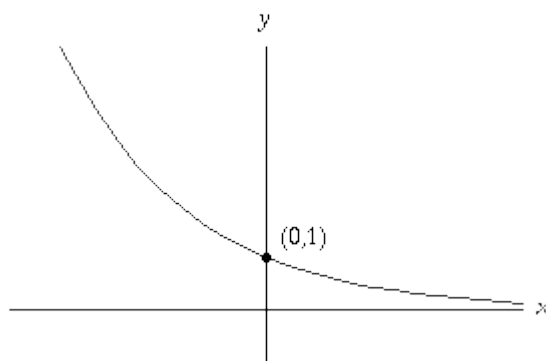
$$y = \frac{1}{x}$$



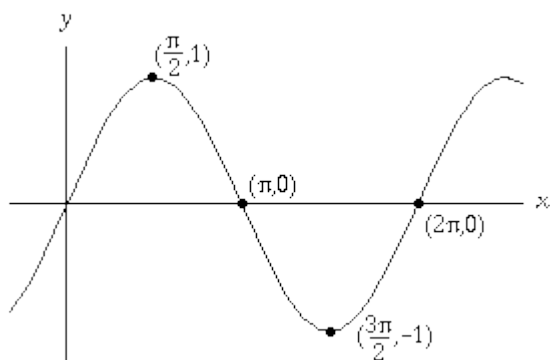
$$y = \ln(x)$$



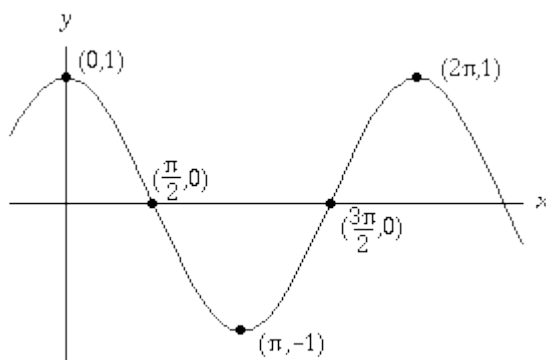
$$y = e^x$$



$$y = e^{-x}$$



$$y = \sin(x)$$



$$y = \cos(x)$$

(OPTIONAL HOMEWORK): Graph the following functions

1. $y = -\frac{2}{5}x + 3$

2. $y = 2x^2 + 1$

3. $y = -x^2 + 7$

4. $y = \sqrt{x + 3}$

5. $y = \frac{x}{12}$

6. $y = e^{2t}$

7. $y = e^{5t}$

8. $y = \cos(x) + 3$

9. $y = -\sin(x)$

10. $y = x^2 + 2x + 1$

* Note for 10. Rewrite y using the Perfect Square Formula.

